Model selection.

| alpha | sample | Root mean square error | Root median square error | Mean relative error | Median relative error |
| --- | --- | --- | --- | --- | --- |
| 0 | in-sample | 0.003241 | 0.001150 | 2.274 | 0.400 |
| out-of-sample | 0.003226 | 0.001145 | 1.741 | 0.407 |
| 0.5 | in-sample | 0.002978 | 0.001151 | 1.995 | 0.387 |
| out-of-sample | 0.002958 | 0.001151 | 1.803 | 0.391 |
| 1 | in-sample | 0.002982 | 0.001148 | 2.034 | 0.387 |
| out-of-sample | 0.002960 | 0.001156 | 1.788 | 0.392 |
| full model | in-sample | 0.002970 | 0.001136 | 2.056 | 0.388 |
| out-of-sample | 0.017573 | 0.009140 | 22.209 | 1.367 |

Model coefficients for alpha= 0.5

| var | coef |
| --- | --- |
| X.Intercept. | 0.00129 |
| fiveq0\_surv | -0.01085 |
| agegroup2 | -0.00003 |
| agegroup3 | 0.00014 |
| agegroup4 | 0.00022 |
| agegroup5 | 0.00034 |
| agegroup6 | 0.00052 |
| agegroup7 | 0.00089 |
| hiv1990 | -0.00587 |
| hiv2000 | 0.01160 |
| hiv2010 | -0.00252 |
| art\_prev2005 | 0.08448 |
| art\_prev2007 | -0.01413 |
| art\_prev2009 | -0.00194 |
| tfr2000 | 0.00002 |
| agegroup2.hiv1990 | 0.00834 |
| agegroup3.hiv1990 | -0.00000 |
| agegroup4.hiv1990 | -0.00944 |
| agegroup5.hiv1990 | 0.03389 |
| agegroup6.hiv1990 | 0.10851 |
| agegroup7.hiv1990 | 0.10874 |
| agegroup2.hiv2000 | -0.00860 |
| agegroup3.hiv2000 | 0.02076 |
| agegroup4.hiv2000 | 0.07820 |
| agegroup5.hiv2000 | 0.11501 |
| agegroup6.hiv2000 | 0.08186 |
| agegroup7.hiv2000 | 0.05500 |
| agegroup2.hiv2010 | 0.00924 |
| agegroup3.hiv2010 | 0.01280 |
| agegroup4.hiv2010 | 0.00691 |
| agegroup5.hiv2010 | -0.00591 |
| agegroup6.hiv2010 | -0.01521 |
| agegroup7.hiv2010 | -0.02168 |
| agegroup3.art\_prev2005 | -0.00467 |
| agegroup4.art\_prev2005 | -0.05989 |
| agegroup5.art\_prev2005 | 0.13509 |
| agegroup6.art\_prev2005 | 2.04501 |
| agegroup7.art\_prev2005 | 1.05982 |
| agegroup5.art\_prev2007 | -0.01910 |
| agegroup6.art\_prev2007 | -0.14934 |
| agegroup7.art\_prev2007 | -0.00406 |
| agegroup2.art\_prev2009 | 0.00378 |
| agegroup3.art\_prev2009 | 0.00826 |
| agegroup5.art\_prev2009 | -0.03110 |
| agegroup6.art\_prev2009 | -0.18319 |
| agegroup7.art\_prev2009 | -0.13635 |